

**WHAT IS CLAIMED IS:**

1. A method for screening for a candidate bioactive agent capable of binding to LTRPC2, said method comprising:
  - a) contacting an LTRPC2 protein or fragment thereof with said candidate agent; and
  - b) determining the binding of said candidate agent to said LTRPC2 protein or fragment thereof.
2. The method of claim 1 wherein a library of two or more of said candidate agents are contacted with said LTRPC2 protein or fragment thereof.
3. The method of claim 1 wherein said LTRPC2 protein comprises amino acids from 1 through about 1503 of SEQ ID NO:1.
4. The method of claim 1 wherein said LTRPC2 protein is encoded by a nucleic acid comprising sequences from 1 through about 4512 of SEQ ID NO:2.
5. A method for screening a candidate bioactive agent comprising
  - a) contacting an LTRPC2 channel with the candidate agent, and
  - b) detecting whether said agent modulates the multivalent cationic permeability of said LTRPC2 channel.
6. The method of claim 5 wherein said modulating activity opens said LTRPC2 channel.

7. The method of claim 5 wherein said modulating activity closes said LTRPC2 channel.

8. A method for screening for a candidate bioactive agent capable of modulating multivalent cation permeability of an LTRPC2 channel, said method

5 comprising:

a) providing a recombinant cell comprising a recombinant nucleic acid comprising nucleic acid encoding LTRPC2 and an inducible promoter operably linked thereto which is capable of expressing said LTRPC2, and further comprising a multivalent cation indicator;

10 b) inducing said recombinant cell to express said LTRPC2;

c) contacting said recombinant cell with a multivalent cation and said candidate agent; and

d) detecting the intracellular levels of said multivalent cation with said indicator.

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9. The method of claim 8 wherein said contacting is of said candidate agent followed by said multivalent cation.

10. The method of claim 8 wherein the modulating activity increases said multivalent cation permeability of said LTRPC2 channel;

20 11. The method of claim 8 wherein the modulating activity decreases said multivalent cation permeability of said LTRPC2 channel.

12. The method of claim 8 wherein said indicator comprises a fluorescent molecule.

13. The method of claim 12 wherein said fluorescent molecule comprises fura-2.

5 14. A method for measuring multivalent cation permeability of an LTRPC2 channel, said method comprising:

a) providing a recombinant cell wherein said cell comprises a recombinant nucleic acid which expresses LTRPC2 and further comprises a multivalent cation indicator;

10 b) contacting said recombinant cell with a multivalent cation which selectively interacts with said indicator to generate a signal; and

c) measuring the intracellular levels of said multivalent cation by detecting said indicator signal.

15 15. The method of claim 14 wherein said indicator comprises a fluorescent molecule.

16. The method of claim 15 wherein said fluorescent molecule comprises fura-2.

17. The method of claim 14 further comprising contacting said recombinant cell with a candidate bioactive agent.

18. The method of claim 17 wherein said modulating activity increases said multivalent cation permeability of said LTRPC2 channel;

19. The method of claim 17 wherein said modulating activity decreases said multivalent cation permeability of said LTRPC2 channel.

5 20. The method of claim 17 wherein said measuring further comprises comparing said intracellular multivalent cation levels to intracellular multivalent cation levels in a cell which does not express recombinant LTRPC2.

21. The method of claim 17 wherein said measuring further comprises  
10 comparing said intracellular multivalent cation levels to intracellular multivalent cation levels in a cell which does not express recombinant LTRPC2 but which is in contact with said candidate agent.

22. A method for screening for a candidate bioactive agent capable of modulating expression of an LTRPC2 protein or fragment thereof comprising:

- 15 a) providing a recombinant cell capable of expressing a recombinant nucleic acid encoding an LTRPC2 protein;
- b) contacting said cell with said candidate agent; and
- c) determining the effect of said candidate agent on the expression of said recombinant nucleic acid.

23. The method of claim 22 wherein said determining is a phenotype of said  
20 cell.

24. The method of claim 22 wherein the determining comprises determining the level of expression of LTRPC2 in the presence of said candidate agent and comparing said level of expression to endogenous LTRPC2 levels.

25. The method of claims 1, 5, 8, 14, and 22, wherein said candidate agent  
5 comprises a small molecule, protein, polypeptide or nucleic acid.